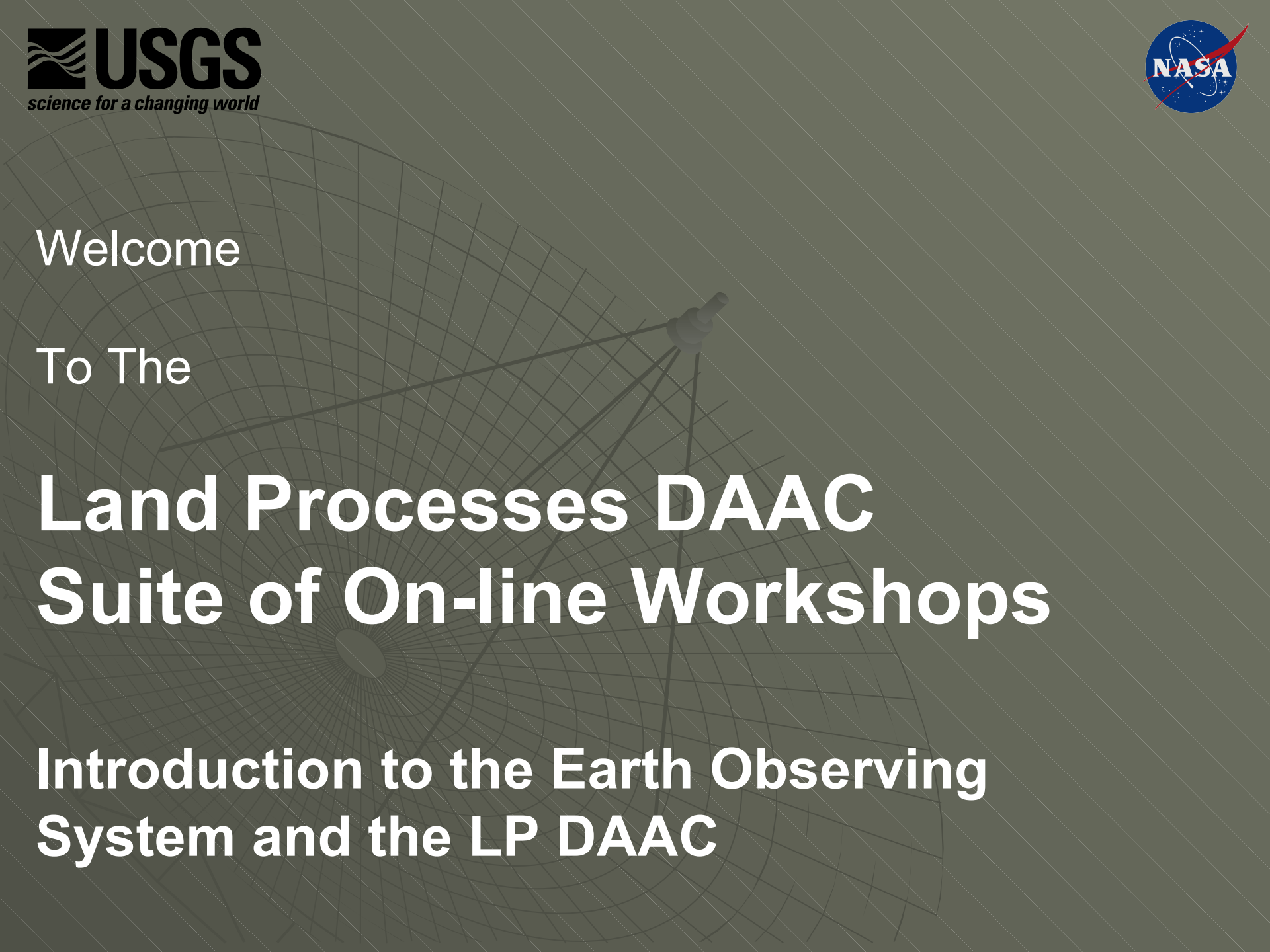


Welcome

To The

# Land Processes DAAC Suite of On-line Workshops

## Introduction to the Earth Observing System and the LP DAAC

# Slide 2 – EOS and LP Intro

- Specific topics that you will learn about include the mission of the NASA Earth Observing System, the LP DAAC's role within the NASA Earth Observing System, the data that is archived and distributed by the LP DAAC, and where to find information on and order data from the LP DAAC.

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# Slide 3 – EOS & NASA

- The Earth Observing System is a major component of NASA's Earth-Sun System missions.
- The mission of the Earth Observing System is to "use spaceborne sensors to gain an unprecedented understanding of the Earth and determine the effects of natural and human-induced changes on the global environment."
- The Earth Observing System is currently comprised of three satellite platforms, which are Terra, Aqua, and Aura. Each satellite payload includes various sensors that are designed to measure how the systems of the earth interact with each other and are influenced by change, for example the study of volcanoes or the carbon cycle.
- The Aura satellite sensors measure atmospheric data and will not be included in this workshop.

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# Slide 4 – What Influences Major Climate Change?

- Influences for global change and Earth Observing System data include radiation, water vapor and precipitation, atmospheric and oceanic circulation, atmospheric chemistry and greenhouse gases, land ecosystems and hydrology, cryospheric systems, volcanoes, and aerosols.
- Sensors on the Terra, Aqua, and Aura satellites provide data on these influences and assist with scientific investigations into their interactions.

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# Slide 5 – Terra Satellite

- The Terra satellite was launched on December 18, 1999, and its payload includes the ASTER, CERES, MISR, MODIS, and MOPITT sensors.
- The mission of Terra is "to observe and measure how the Earth's atmosphere, cryosphere, lands, oceans, and life interact.
- The LP DAAC archives and distributes land processes data collected from the ASTER and MODIS sensors on Terra.

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# Slide 6 – Aqua Satellite

- The Aqua satellite was launched on May 4, 2002, and its payload includes the AIRS, AMSR/E, AMSU, CERES, HSB, and MODIS sensors.
- Similar to Terra, the Aqua satellite provides data on the interaction of the atmosphere, cryosphere, lands, and oceans. The LP DAAC archives and distributes land processes data collected from the MODIS sensor on Aqua.

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# Slide 7 – How is EOS Data Managed?

- Data collected from the sensors of these three satellites represents 20 plus years of data that are available to the user community.
- The Earth Observing System Data and Information System or EOSDIS was created to perform various functions related to Earth Science, including the management and distribution of data products through the Distributed Active Archive Centers or DAACs.

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# Slide 8 – Data Centers

- The role of each DAAC is to process, archive, document, and distribute data from NASA's past and current research satellites and field programs.
- Each center serves one or more specific Earth science disciplines and provides data products, data information, services, and tools unique to its particular science.
- The LP DAAC archives, processes, and distributes ASTER and MODIS land processes data products.

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# Slide 9 – LP DAAC EROS

- The LP DAAC is housed at the United States Geological Survey's Earth Resources Observation and Science Center or (EROS), which is located near Sioux Falls, South Dakota.

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# Slide 10 – LP DAAC Web Site

- As mentioned previously the LP DAAC is one of several discipline-specific data centers within the NASA Earth Observing System Data and Information System.
- Users can find key information about products and services from our Web site.  Our home page and News section provides important updates and information for our users.
- The products section provides information on LP DAAC products and links to other product documentation.
- The Get Data section provides links and information on how to order LP DAAC data.
- The Tools section provides information on useful tools that can be used to manipulate LP DAAC data.
- Finally, the User Community section provides examples of how LP DAAC data are being used by our community of users.

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# Slide 11 – Remote Sensing

- In addition to the imagery that can be created from ASTER and MODIS, these data also contain information for use in scientific investigations.
- Remote sensing technology creates images by reading sunlight, and as indicated in this image, only a small portion of sunlight is visible to humans. The electromagnetic spectrum includes many other bands of light that the human eye is not able to see.
- Satellite sensors can record data that is otherwise invisible for use in studying the Earth.
- For example, vegetation appears green to us because plants reflect green light from the visible band. However, vegetation also responds very strongly to light from the infrared band. When changes occur in the physical structure or chemistry of a plant, it may not immediately affect how green the plant looks, but it has a big effect on how infrared light is reflected.
- These data can then be used in scientific investigations to assess crop or forest health.

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# Slide 12 – LP DAAC Data

- The LP DAAC archives, produces, and distributes data from three sensors on-board two satellites, Terra and Aqua. The ASTER and one MODIS sensor are part of the payload on Terra, and one MODIS sensor is on-board Aqua.
- There are currently 20 ASTER products and over 60 MODIS products available from the LP DAAC archive. These data are available as grid or swath data, and data distributed by the LP DAAC are in the HDF-EOS format. HDF-EOS is a software library that supports the construction of new data structures, including grid, point, and swath.
- Both sensors have been found useful for investigations beyond their intended purpose. For example, ASTER is frequently used for volcano and disaster monitoring, and MODIS data has been used for research in forest degradation and invasive species.

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# Slide 13 – ASTER & MODIS

- Resulting data from the ASTER and MODIS sensors are very different from each other.
- Generally speaking, ASTER data are a higher resolution data measuring frequencies of the electromagnetic spectrum that are useful for geological investigations, and MODIS data are at a moderate resolution and collected for research in global change study.
- With a 60 kilometer by 60 kilometer footprint and a 15-meter resolution for the visible bands, ASTER can be considered for use with a more localized or specific area of interest.
- MODIS is a more general or broad type of data that offers daily coverage of the earth in 250-, 500-, 1000-, or 5600-meter resolution.  Please take a moment to notice the differences of these two images.

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# Slide 14 – Ordering Data

- There are several ways to search, order, and browse for ASTER and MODIS data.
- Information on each of the ordering interfaces, or clients, can be found in the Get Data area of the LP DAAC Web site.
- Each client is unique and tailored to suit the different needs of the LP DAAC user community. These clients will be discussed in greater detail in future workshops.
- For now, please take a moment to view the differences of each client and visit the LP DAAC Web site or contact LP DAAC User Services for more information.

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# Slide 15 – Thank You

- Thank you for viewing the Introduction to the Earth Observing System and LP DAAC On-Line Workshop.
- We encourage you to continue with our on-line workshops by visiting the Introduction to ASTER Data Workshop or Introduction to MODIS Data Workshop for more specific information about the data that is archived, processed, and distributed by the LP DAAC.

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